

XVII. *Notæ Dipterologicæ.* No. 4.—*Monograph of the genus Systropus, with notes on the economy of a new species of that genus.* By J. O. WESTWOOD, M.A., F.L.S., Pres. Ent. Soc., &c.

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IN a collection of insects sent from Natal by Herr Gueinzius were several specimens of a new species of the remarkable Dipterous genus *Systropus*, together with several cocoons and their contents found upon a tree of the genus *Mimosa*, from one of which one of the *Systropi* had been bred. The perfect insect itself is described below, under the name of *S. crudelis*.

The cocoons are of an oval form, except that on one side they are flattened, showing marks of having on that side been attached to the bark of a branch or stem of the tree. At one end is a circular piece which is easily disengaged, the insect making its escape through the orifice formed by its removal. This cocoon is 7 lines long. The outer surface is quite smooth but not shining; the inner surface is also smooth and glossy, having its upper end of a darker colour than the remainder of the interior. In the absence of direct information we can only conjecture that the cocoon is that of a species of Egger moth (as certain British species are termed from the egg-like cocoon formed by their caterpillars), whilst the thick, parchment-like covering and shape of the cocoon agrees with those of the stinging larvæ of the genera *Limacodes* or *Doratifera*.

Within each of these cocoons was found the pupa represented, magnified in the accompanying figures 6, 7 and 8, of a short and thickened form, and quite unlike the parasitical pupæ of *Anthrax* or *Bombylius*. The head-piece is armed with a strong, conical, frontal projection, by means of which the pupa is doubtless enabled to push off the operculum at the end of the cocoon. The head on the underside is furnished with a long appendage, extending along the breast as far as the first ventral segment; its basal half is grooved down the centre as though it consisted of two halves; these are probably the antennæ cases: the remainder of the appendage seems jointed in the middle.

This is evidently the sheath of the proboscis. The cases of the two fore legs are very short and bent back at the extremity of the femora, lying close upon the breast, whilst the cases of the two middle legs are more elongated, also resting upon the breast and extending as far as the wing covers; which latter cover the cases of the hind legs, except the extremity of the tibiae and the five-jointed tarsi. The abdomen is very robust and convex, each segment having a strong, short, curved bristle at each side, whilst the dorsal surface of each of the principal segments is furnished with a transverse row of very short, fine spines, which doubtless assist, with the lateral spines, in enabling the insect to push itself forward through the front orifice of the cocoon when the cap is removed.

No one looking at this pupa would have supposed that it could have produced such an elongated, slender imago as the *Systropus*; but, fortunately, in one of the specimens the perfect insect had been secured in the act of making its escape from the pupa case, as represented in figure 9. Moreover, there can be no doubt from the necromorphous character of the pupæ (the limbs lying free, not soldered down as in the pupa of Lepidopterous insects), that the pupa is really that of a Dipterous insect and not of a Lepidopterous insect, within which the parasitic Dipteron had been reared. Although searched for with much care I did not succeed in finding, lying within the cocoon, any portion of the skin of the larva by which it had been formed, and suppose, therefore, that the parasite had entirely devoured it. Hence arises the question as to the precise nature of the parasitism of the *Systropus*. Was its larva an internal parasite, like the larva of the *Tachinæ*? or was it external, like the larva of *Scolia*, as described by Passerini? The latter seems to imply difficulties in the formation of a compact, oval cocoon, like that before us, by a caterpillar infested by an external parasite, unless we suppose that it was not until the cocoon had been formed, that the egg of the parasite, which had been attached to the outer surface of the caterpillar, had hatched, so as to enable the parasitic larva to feed without hindrance upon its prey within the closed cell of the cocoon. Further observations are therefore needed to determine this curious question.

The specimen of the imago making its escape from the pupa skin, as shown in fig. 9, exhibited the different parts of the mouth in a condition very different from their ap-

pearance when fully developed; instead of forming an apparently solid, single, porrected proboscis with the end divided into two recurved, slender lobes, the mouth presented four delicate, straight lancets, represented in fig. 10; one, the longest (fig. 10a), representing the labium; another, about two-thirds of the length of the former, which I regard as the tongue (fig. 10b), two still shorter pieces which seem to represent the maxillæ (fig. 10cc); and at the base are two short, thicker pieces which I regard as the palpi (fig. 10dd); the upper lip (labrum) would thus be unrepresented.

It is interesting to find that the species of this anomalous genus are not confined to a narrow geographical range, but are very widely distributed; being natives of Africa, India, the Malayan Archipelago and South America.

Two additional species of the genus have, I believe, been described by Signor Costa; but I have not been able to meet with the memoir in which his descriptions are published.

Division A. Species Africanæ.

Sp. 1. *Systropus macilentus*.

"Thorace nigro, utrinque subcoccinelloe; abdomine fusco, basi apiceque nigro, alis infumatis."

"Fühler braun, 2 und 3 Glied schwarz: Untergesicht braun, Mundspalte strohgelb, Stirne gelblich. Augen am Scheitel in Berührung: Augenhöhlenränder silberweiss. Rückenschild mit sehr kurzen weisslichen Härchen; neben dem Schildchen an jeder Seite ein strohgelber Punkt. Hinterleibstiel ocherbraun. Schwinger braun; Knopf unten weisslich, oben schwarz. Beine reinbraun; Spitze der hintersten Schenkel schwarz; hinterste Schiene rostgelblich, mit schwarzer Spitze. Fusswurzel spitze bräunlich-schwarz."

Long. corp. lin. 7.

Habitat apud Promont. bonæ spei.

In Mus. Berol. et Westermann. Etiam in Sierra Leone (Morgan). In Mus. Britann. (teste Walker, an recte?)

Systr. macilentus, Wiedemann, Nov. Dipt. gen. p. 19, fig. 7; Auss. zweifl. Ins. 1, p. 360, pl. 5, fig. 6; Macquart, Hist. Dipt. 1, p. 592, pl. 9, fig. 21; Walker, Cat. Dipt. Brit. Mus. p. 1154.

Sp. 2. *Systropus leptogaster*.

"Niger, facie humeris coxisque anticis pallidissime flavis, abdominis segmentis 2ndo, 3to, 4to, et 5to rufis, vittâ nigro-brunneâ signatis, cellulis alarum submarginalibus tribus."

Long. corp. lin. 6½; long. alar. lin. 4⅔.

Habitat in Caffrariâ (Wahlberg).

Systropus leptogaster, Loew. Dipt. S. Afr. p. 200.

Sp. 3. *Systropus crudelis*, Westw. (Pl. X. fig. 1—12.)

Niger, opacus, griseo-sericeus, antennarum articulo basali, pedibus cum coxis anticis (basi femorum apicibusque tarsorum nigricantibus exceptis), lateribus thoracis, ad basin alarum, abdominis segmentis tribus basalibus, ferruginosis; facie antice fusca tibiisque anticis argenteosericeis; alis pallide cinereis, costâ late maculâque subcostali ante medium alarum nigris.

Long. corp. lin. 9; expans. alar. lin. 11.

Habitat in Nataliâ (Gueinzius). In Mus. Hopeiano Oxoniæ.

Variat paullo major, facie inter oculos antice, angulis anticis humeralibus thoracis, fasciâ tenui transversâ postscutellari ferrugineis, pleuris prothoracis puncto utrinque albido, metasterno post pedes posticos magis convexo.

Habitat in Damara Land (Anderson). In Mus. Hopeiano Oxoniæ.

S. macilento major et minus ferruginosus et e *S. leptogastro* coxis anticis obscure coloratis primo intuitu distinctus.

Division B. Species Asiaticæ.

Sp. 4. *Systropus Ophioneus*.

Niger, thorace flavo-maculato, abdome obscure fulvo, strigâ dorsali nigrâ; femoribus posticis ferrugineis; tibiis posticis basi et apice pallidis, tarsis posticis nigris.

Long. corp. lin. 7; expans. alar. lin. 9½.

Habitat in Indiâ Orientali (D. Boys). In Mus. Hopeiano Oxoniæ (olim nostr.).

Systropus Ophioneus, Westw. Trans. Ent. Soc. v. p. 233, pl. 23, fig. 6.

Caput antice inter oculos albidum. Thorax humeris, lateribus antice, cum coxis anticis, maculâ utrinque trigonâ ante alas, puncto parvo utrinque ante sentellum

alteroque scutellari, albidis. Pedes antici flavidii, femoribus prope basin obscurioribus; pedibus intermediis flavidis, femoribus nigricantibus apice pallidis, tibiis mediis in medio obscuris. Alae clariores, venis nigris.

Sp. 5. *Systropus Polistoides*, Westw.

Niger, albido-variegatus; alis griseo-fuscescenti tinetis, puncto medio obscuro; antennis nigris, articulo basali albo.

Habitat Chantibon, Siam (Mouhot).

Head black, eyes united on crown of head; face narrow, widening below, albidous and silvery, the orifice for the rostrum extends half-way up the narrowed front. Antennæ black, basal joint albidous, extreme tips black; 2nd joint short, black; 3rd more than two-thirds the length of the 1st, flat, black, broader than the other joints.

Thorax black, anterior lateral angles with a large albidous spot extending irregularly down the sides and touching the base of anterior coxæ; a quadrate spot on each side of the dorsum of thorax in front of each wing; a transverse line behind wings, extending across dorsum, with each end pointed and directed forwards; a very minute spot at the base of each of the halteres, and a large oblong spot on each side of the thorax below the wings, extending to the base of the hind legs. Halteres brownish, with white knobs. Abdomen with their basal joints albidous, the upper part of each black, the black extending at the extremity of each joint down the sides of the joints, 4th segment black, with a basal albidous fascia, interrupted with black in the middle of the back; 5th, 6th and 7th segments black, with the hind margin of each narrowly albidous. Anterior coxae albidous, fore legs albidous, basal half of femora and four terminal joints of tarsi black; middle legs similarly coloured; hind femora and tibiæ pale brown above, albidous below, tips of tibiæ black; tarsi brown, terminal joints black; wings smoky-grey, slightly tinged with yellowish on the costa, veins black, a spot behind the middle of the costa blackish (where the veins fork).

Sp. 6. *Systropus Eumenoides*. (Pl. X. fig. 13—15.)

Flavus, antennarum apice thoraceque nigro-variegato, abdome apicem versus nigro-fasciato.

Long. corp. lin. 9.

Habitat in partibus septentrionalibus Indiae orientalis. In Mus. Britann., olim Saunders.

Systropus Eumenoides, Westw. in Guérin-Méneville,
Mag. Zool. 1842, pl. 90, texte, p. 4.

Antennæ flavæ, articuli 1mi summo apice articulisque 2ndo et 3to nigris. Facies et pars postica capitidis flavæ. Thorax flavus, vittâ antice mediâ, maculâ magnâ cordiformi discoidali, maculis duabus parvis versus humeros alterisque duabus cuneatis ad basin alarum extensis nigris. Sternum posticum flavum, nigro-maculatum. Abdomen segmento 1mo supra nigro, quatuor proximis flavis, lineâ tenui dorsali interruptâ fuscâ, duobus proximis nigris, margine postico flavis. Halteres flavi. Alæ flavidohyalinæ, costâ parum obscuriori, venis posteostalibus fulvis; aliis fuscis. Pedes quatuor antice flavi; tarsis summo apice nigris. Pedes postici femoribus fusco-flavidis; tibiis flavis, vittâ externâ fuscâ annuloque subapicali nigricanti, tarsis vittâ superâ fuscâ.

Sp. 7. *Systropus sphecooides*.

Niger; capite albido-testaceo, antennis apicem versus lanceolatis, thorace strigis quatuor lateralibus pallide flavis; abdomine lurido, basi et apicem versus nigro, petiole longissimo; femoribus subtus tibiisque apice luridis, alis nigricanti-cinereis, halteribus albidis, nigro-fasciatis.

Systropus sphecooides, Walker in Proc. Linn. Soc. vol. iv. p. 113.

Male.—Black, head white behind, whitish testaceous in front about the eyes; proboscis longer than the breadth of the head, its sheaths diverging and convoluted at the tips; antennæ a little longer than the proboscis, lanceolate towards the tips; thorax with two pale yellow streaks on each side, one in front the other behind the wing; abdomen lurid black at the base above and towards the tip, where it is fusiform, its petiole very long and slender; femora beneath and tibiae towards the tips lurid; wings blackish-grey, veins black; halteres whitish, with a black subapical band.

Length of the body 7 lines; of the wings 8 lines.

Habitat in insulâ Makassar. Etiam (sub nomine *S. sphecooides*) in insulâ Celebes; Walk., Proc. Linn. Soc. ix. p. 15.

In Mus. Britann. (olim Saunders).

Sp. 8. *Systropus tipuloides*.

Niger, opacus, facie antice, thoracis vittâ transversâ anticâ (in medio interruptâ), cum pleuris, punctisqne

duobus utrinque ad basin alarum; abdomine piceo, subtus et incisuris segmentorum basarium albido; pedibus anticis flavidis, coxis nigris, pedibus intermediis piceis; tibiis tarsisque pallidioribus, pedibus posticis piceis, femoribus subtus et apicibus castaneis; tibiis basi apiceque anguste albido, tarsis basi albido; alis obscure cinereis, halteribus piceis, clavae apice et subtus albido.

Long. corp. lin. 9; expans. alar. lin. 13.

Habitat in insulâ Sulu Malayanâ (Wallace). In Mus. Hopeiano Oxoniæ.

Division C. Species Americanæ.

Sp. 9. *Systropus nitidus*.

“Niger; thorace utrinque albo-picto, ventre aurantiaco.”

“Fühler schwarz, schlanker als bei *S. macilentus*, und das Endglied ein wenig langer als das vorletzte: Untergesicht strohgelb, an beiden Seiten silberschimmernd. Stirn ebenso: Rückenschild tief schwarz, an den Schultern und Seitenrändern strohgelb, welches an der Flügelleinkung unterbrochen ist. Brustseiten ganz vorn strohgelb, weiter hinten weisschimmernd, dazwischen schwarz; Hinterleib oben auf schwarz. Bauch gelb was nach hinten immer mehr pomeranzenfarb wird. Flügel licht rauchgrau; Adern schwarz. Schwingerstiel strohgelb, Knopf schwarz, doch oben auch gelb: hinterste Beine schwarz; vordere gelb.”

Long. corp. lin. 10, mas.

Habitat in Brasiliâ. In Mus. Berol.; etiam e Bogotâ; in Mus. Hopeiano Oxoniæ.

Systr. nitidus, Wiedemann, Auss. zweifl. Ins. 11, p. 641; Westw. in Guérin, Mag. Zool. 1842.

There is a specimen named *S. nitidus* in the British Museum, from the Saunders Collection, without locality, and with the sides of the front part of the thorax whitish, with a black spot.

Sp. 10. *Systropus fumipennis*.

Niger; thorace vittâ mediâ cinereâ; pedibus nigris; alis cinereo-hyalinis, nubilâ fuscâ pone medium.

Long. corp. lin. 9.

Habitat in Brasiliâ.

In Mus. Britann. et Hopeiano Oxoniæ (olim nostr.).

Systropus fumipennis, Westw. in Guérin-Ménev. Mag. Zool. 1842, text of pl. 90, p. 3.

Syn. *Systropus niger*, Walker, Cat. Dipt. Brit. Mus. p. 1154. In Mus. Britann.

Antennæ nigræ, articulo 3to 2ndo triplo longiori. Thorax niger, puncto minuto utrinque albido ad angulos anticos, vittâ mediâ longitudinali dorsali cinereâ, lateribus albo-sericeis. Pedes nigri, femoribus duobus anticis basi externe rufis. Halteres picci, clavâ nigrâ subtus albâ. Abdomen nigrum, segmentis basalibus subtus pallidioribus. Alæ obscure cinereo-hyalinæ, costâ obscuriori, puncto nigricanti ad furecationem venæ postcostalis, et nubilâ fusca transversâ versus apicem alarum.

Sp. 11. *Systropus Fœnoides*.

Niger, thoracis dorso cinereo longitudinaliter vittato, lateribus antice vittâ abbreviatâ transversâ albidiâ, metano utrinque puncto albido minuto notato; abdomine basi supra nigro, subtus albido; apice ruso-fulvo; pedibus nigris; anticis subtus albidis.

Long. corp. lin. 9.

Habitat in Mexico.

In Mus. Hopeiano Oxoniæ (olim nostr.).

Syst. *Fœnoides*, Westw. in Guérin-Méneville, Mag. Zool. 1842, text of pl. 90, p. 2.

Antennæ nigræ, articulo 3to 2ndo duplo longiori. Facies inter oculos, margines cavitatis oralis et pars postica capitis albo-sericei. Thorax supra niger, vittis duabus longitudinalibus cinereis; humeris maculâ parvâ transversâ cuneatâ, et angulis posticis mesothoracis scuti albidis punctoque minuto flavescenti, utrinque ad latera scutelli. Epimera prothoracica albida, meso- et meta-thoracica nigra, albo-sericea, sterno subtus abdominis insertionem transverse rugoso et cavitate conicâ ad basin abdominis extensâ membranâ tectâ. Halteres picci, clavâ supra nigrâ, subtus albâ. Abdomen supra dimidio basali nigro, subtus albido, apice fulvo supra obscuriori. Pedes antici nigri, femoribus externe ad basin rufis, apice tibiis articulisque duobus basalibus tarsorum externe albis. Pedes intermedii nigri, femoribus apice, tibiis totis articulisque duobus basalibus tarsorum externe albis. Pedes postici nigri, puncto ad basin tibiarum albo. Alæ cinereo-hyalinæ, costâ paulo obscuriori, puncto parvo nigricanti ad furecationem venæ postcostalis.

DESCRIPTION OF PLATE X.

- Fig. 1. The cocoon of the natural size, seen in front.
- Fig. 2. The same seen sideways.
- Fig. 3. The same seen from behind, the flattened part being removed, showing the dark upper part.
- Fig. 4. The upper end of the same after the removal of the operculum, showing the head of the enclosed pupa.
- Fig. 5. The operculum or top of the cocoon.
- Fig. 6. The pupa seen sideways.
- Fig. 7. The ventral surface of the same.
- Fig. 8. The dorsal surface of the same.
- Fig. 9. The pupa seen laterally, showing the front part of the body of the imago protruded from its anterior end.
- Fig. 10. The parts of the mouth shown by the imago whilst in the act of making its escape.
- Fig. 11. The perfect insect, *Systropus crudelis*.
- Fig. 12. One of its wings.
- Fig. 13. *Systropus Eumenoides*.
- Fig. 14. Thorax of the same, seen sideways.
- Fig. 15. Dorsal view, showing the segmentation of the thorax.